

## DETAILED ACTION

### *Examiner's Comments*

An amendment, amending claim 1, was received and entered on 6/2/11. Claims 14-17 remain withdrawn pursuant to an election made on 4/24/2009.

### *Response to Arguments*

1. Applicant's arguments with respect to claim 1 and the newly added limitation that the chain transfer agent is added after completing the preparation of the outermost shell have been considered but are moot in view of the new ground(s) of rejection in light of Baker et al. (US 5,585,184).

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (US 2003/0105222) in light of Izaki et al. (US 3,970,629) and Baker et al. (US 5,585,184).

**Claims 1-7:** Choi teaches a method of making a styrene-butadiene latex for coating paper (Abst.) consisting essentially of the steps: preparing a core of styrene butadiene (¶ 0027) and forming multiple coatings around the core (¶¶ 0028-0029) wherein the core and shell each are formed by emulsion polymerization (see, e.g., ¶ 0023) with a composition comprising 20-55 parts by weight 1,3-butadiene, 45-80 parts of styrene, 1-15 parts of ethylene unsaturated acid monomer, 0.1-20 parts of cyanide vinyl monomer, 0.1-30 parts of a copolymerizable monomer and 0.1-10 parts of a chain transfer agent such as a mercaptan with 6-17 carbon atoms (¶¶ 0042, 0046, 0049). In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art "a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the compositions claimed by applicant because Choi teaches ranges which encompass these compositions.

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Choi also teaches that the gel content and molecular weight of the latex is adjusted with the chain transfer agent (§ 0049), but fails to expressly teach that this agent is added singly after the coating steps. Izaki, however, a method of forming a copolymer latex for use as a paper coating (Abst.) wherein mercaptan is used as a chain transfer agent to adjust the molecular weight and gel content of the latex (3:51-4:8). Izaki further teaches that it is known in the art that the chain transfer agent may be added singly as opposed to introducing it with the monomer composition (4:4-8) in order to adjust the molecular weight and gel content of the formed latex shell. Izaki further explains that the chain transfer agent is added when a conversion rate is below 95% (see, e.g., 4:8-32). In addition, Izaki teaches that the amount of chain transfer agent can be adjusted based on the conversion ratio (4:8-32). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have introduced the chain transfer agent singly, as taught by Izaki, with the predictable expectation of success because Izaki teaches that the introduction of the chain transfer agent singly is a known and suitable alternative to introducing the chain transfer agent with the monomer composition and further because Izaki teaches that the chain transfer agent is used to adjust the gel content of the formed copolymer.

Choi and Izaki, however, fail to expressly teach that the chain transfer agent is added after completing the preparation of the outermost layer. Baker teaches a method of forming a core/shell polymer (Abst.) wherein a prepolymer (i.e. a monomer) is applied to a core (see, e.g. 16:8-18) and the chain transfer agent is not added until after the prepolymerization process has been initiated (i.e. after completing the preparation of the outermost layer of monomers) in order to reduce stickiness (11:7-17). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the chain transfer agent to the core-shell polymer after completing the preparation of the outermost layer in the method of Choi and Izaki with the predictable expectation of successfully reducing the stickiness of the obtained particles.

**Claim 8:** Choi further teaches that the ethylene unsaturated acid monomer is methacrylic acid (§ 0045).

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**Claim 9:** Choi further teaches that the cyanide vinyl monomer is acrylonitrile (§ 0047).

**Claim 10:** Choi further teaches that the copolymerizable monomer is butylmethacrylate (§ 0048).

**Claim 11:** Choi further teaches that the gel content can be optimized based on the composition of the monomers used (§ 0013). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have adjusted the gel content of the latex, as taught by Choi, by adjusting the amount of each monomer used in the compositions in order to provide the desired gel content with the predictable expectation of success.

**Claim 12:** Choi also teaches that the glass transition temperature of the core and shell latexes are between -20 and 25°C (§ 0050). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected a composition for the core which provided a glass transition temperature of -10 to 25°C and similarly selected for the shell a composition which provided a glass transition temperature of -20 to 25°C with the predictable expectation of success.

**Claim 13:** Choi also teaches that the core diameter is 70 nm (§ 0057) and the core-shell diameter is 100-150 nm (§ 0050). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed particles of 130-150 nm in the method of Choi because Choi teaches that the particles formed may be 100-150 nm.

### **Conclusion**

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT VETERE whose telephone number is (571)270-1864. The examiner can normally be reached on Mon-Fri 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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